Reference Materials

Arizona Statewide Interoperable Communications Stakeholder Working Session

Prepared by Staff of
Public Safety Interoperable Communications (PSIC) Office
Government Information Technology Agency
STATE OF ARIZONA

November 20, 2008

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Table of Contents

10:30-11:30 AM Facilitated Discussion: Current Status of Interoperable Communications in Arizona

AIRS

The state has been building out the Arizona Interoperable Radio System (AIRS) radio network, based on its predecessor Interagency Arizona Radio System (IARS). Originally planned and built in the early 1980s, IARS served the law enforcement community by providing VHF and UHF base stations at key locations. These stations could be linked together to allow VHF users to communicate with UHF users. As the system developed, some sites were also equipped with 800 MHz repeaters. A total of 17 sites were in operation in 1999. The IARS concept was modernized and expanded using DHS funds in 2006 and 2007, becoming AIRS. Where IARS had only VHF and UHF stations at each site, AIRS uses base station "suites" composed of one wideband VHF, one narrowband VHF, one UHF, and one 800 MHz base stations/ repeaters. *(Reference: Arizona SCIP Section 4.1.7.1 p 60)*

AIRS now allows users of all 3 spectrums to communicate with each other, and has been expanded, with 38 suites to be deployed throughout the state. In 2008, DPS installed 12 AIRS suites, with one mobile AIRS configuration installed in a DPS trailer. Including the La Paz County suite to be located on Cunningham Peak, four remaining AIRS suites still need to deployed, including a replacement for the AIRS suite which was destroyed in the fire on White Tanks and the suite purchased by Mohave County, as facilities permit. In addition, a proposal has recently been approved to install AIRS connectivity to the state microwave network at the State Emergency Operations Center, which will afford AZ Division of Emergency Management (AZDEMA) AIRS connectivity across the State in disaster situations. *(Reference: Presentation by Greg Manning, Project Manager, Wireless Systems Bureau, DPS at October 29, 2008 PSCC/SIEC Meeting)*

Microwave

The state's current microwave network has evolved over the last fifty years to interconnect radio sites located across Arizona with dispatch centers and other facilities. The current system is composed of 84 paths, each connecting two locations. These links range in length from a few miles to over 130 miles, with an average of about 42 miles. In total, the links add up to 3,562 miles, or the distance from Washington, D.C. to Phoenix and back. The microwave network is used mostly to control radio base stations at remote communications sites as described above and may be used to carry computer data and telephone signals. The State of Arizona microwave network connects 57 remote sites with 19 facilities. Although originally built to support the Arizona DPS and other state agency land mobile radio system, many other agencies today use a portion of its

capacity. *(Reference: Arizona SCIP Section 4.1.7.3 p 67)*

The Department of Public Safety will continue to upgrade the state microwave system from its current analog technology to state-of-the-art digital technology. The upgrade will provide infrastructure needed for current and planned public safety communications systems that will allow voice and date sharing capabilities. Additionally, many repairs parts for the current analog system are not available or very difficult to locate thus allowing the current system to be more susceptible to failure. *(Reference: SCIP Executive Summary, p.8)* [Note: An update regarding progress on the upgrade of the Southern loop of the microwave network was presented by Kevin Rogers, Manager, Wireless Systems Bureau, DPS at October 29, 2008 PSCC/SIEC Meeting.]

Strategic Technology Reserve

Arizona currently has five communications vans strategically placed in each of the five RACs. The locations of these vehicles enable them to be on scene throughout the state generally within three hours with a call to the State EOC. Additionally, the state has a number of radio caches deployed using the same mechanism. The Strategic Technology Reserve for this SCIP will augment the current reserves. [Reference: Arizona Statewide Communications Interoperability Plan, November, 2007 Page 179.] Elements of the STR include:

- Satellite Phones for the Governor, Key Staff and Cabinet
- Cache of 800 MHz Radios To Support Key State, Local and Tribal Government
- Portable Wireless LANs, Ruggedized Laptops
- Wireless Telephones
- Portable AIRS Suites

(Reference: Presentation by Ryan Goosley, Communications Officer, ADEM at October 29, 2008 PSCC/SIEC Meeting)

Other Existing State Systems

State System Name	Description
Game & Fish, Dept. of Corrections, Dept. of Juvenile Correction, Parks Board & State Land Dept., Dept. of Agriculture	VHF conventional
Department of Public Safety	UHF conventional
Dept. of Transportation	VHF conventional, 800 MHz trunked
EMSCOM, Veterans Memorial Coliseum, Shared Government Operations	UHF conventional

Modern Regional Systems

Regional System Name	Description	Status
Phoenix Regional Wireless Network (PRWN)	800 MHz P25, simulcast trunked	Existing
Mesa Regional System (TOPAZ)	800 MHz P25, simulcast trunked	Existing
Pima County Wireless Integrated Network (PCWIN)	800 MHz P25, simulcast trunked	Planned
Central Arizona Project	800 MHz trunked	Existing
Salt River Project	VHF conventional, UHF conventional, 900 MHz trunked	Existing
Arizona Public Service	800 MHz trunked	Existing
Northern Arizona University and City of Flagstaff	800 MHz trunked	Existing
Yuma Regional Communications System (YRCS)	800 MHz, P25 trunked	Existing and being enhanced
Phoenix Fire Regional Dispatch	VHF conventional	Existing
Prescott regional communications	VHF conventional	Existing
Sedona fire regional	VHF conventional	Existing

(Reference: SCIP Implementation Report dated September 10, 2008, p 6)

PSCC Long Term Solution ***(Planned)***

The statewide system is planned as the ultimate approach to interoperability among all public safety entities in the State. The planned system is an open standards, compliant (Project-25, Telecommunication Industry Association-102), 7/800 MHz trunked radio system. It will have sufficient capacity for state agencies and those local, federal, and tribal agencies who desire to participate. It can be expanded in capacity to serve additional agencies and extended to cover additional land areas. It will have high-level network connections to allow existing regional radio systems to be interconnected to the statewide system. *(Source: Arizona SCIP Executive Summary, P 9)*

11:30 AM - 12:30 PM Facilitated Discussion: Demonstration Project

Demonstration Project Overview

The state will demonstrate the interoperable architecture (organizational and system) that has been identified as the baseline design for the expanded statewide system. Methods to expand current systems for greater coverage will show how government entities can work together to form governance agreements. The project will also show how completely separate radio systems can be interconnected to permit continuous radio coverage over large portions of the state. The Demonstration Project will include four components:

- Provide state personnel with radios that will be used on the Phoenix-Mesa metro 800 MHz system, demonstrating the interoperable nature of Project-25 systems and validating forms of inter-governmental agreements.

- Build a 700 MHz site on White Tank Mountains to expand the Phoenix-Mesa 800 MHz system coverage west of the metro area. Governance issues will also be identified as inter-governmental agreements are formed.

- Build a 700 MHz site on Oatman Mountain to expand westward the coverage of the Yuma Regional Communications System (YRCS) 800 MHz network to the east. Governance issues will be identified as inter-governmental agreements are formed.

- The Demonstration Project will then connect the Phoenix and Yuma systems together to validate roaming and intersystem communications, as well as additional governance and system management issues.

  (Source: Arizona SCIP Section 4.1.7.6, p 71)

Reference Materials
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November 20, 2008

AZ Department of Public Safety Memorandum Dated September 2, 2008
(David Felix, Executive Officer, DPS to
Lisa Dee Meyerson, Strategic Initiatives Unit Chief, GITA)

From: DFelix@azdps.gov [mailto:DFelix@azdps.gov]
Sent: Tuesday, September 02, 2008 2:29 PM
To: Lisa Meyerson
Cc: Georgene Ramming; CKnight@azdps.gov
Subject: Demo Project Recommendation

Here is our final overview and recommendation for the immediate future of the PSCC interoperability demonstration project.

ATTACHMENT

PSCC Demonstration Project Overview
And Recommendation for Further Action

The PSCC Demonstration Project was conceived and implemented to demonstrate one technical and operational approach to interoperability. The Demonstration Project leverages the existing regional wireless networks in Phoenix and Yuma by enhancing the coverage and by connecting the two networks to allow for one large composite network.

At the beginning of this endeavor, the expansion of the Phoenix and Yuma systems to enhance coverage was fairly straightforward. Both Phoenix and Yuma had existing contracts with Motorola to provide the RF site equipment to add to their existing expandable systems. However, the methodology to connect the Phoenix and Yuma systems was an area that could be improved upon with some cutting edge development that Motorola was working on.

The original project plan called for the installation of consoles (located at DPS) to facilitate audio patching of talk-groups between the Phoenix and Yuma systems. Later, Motorola was also able to provide a prototype, Inter Subsystem Interface (ISSI) to demonstrate a superior method of system interconnection.

On June 30, 2008, technical staff from DPS, Phoenix, Yuma, and Motorola demonstrated the first radio calls between units on the Phoenix and Yuma systems utilizing an ISSI based on Project 25 standard protocol. This was a historical event because it was the first demonstration of its kind between live systems. We also demonstrated the console patch methodology and can see that the prototype ISSI improves on audio quality, reduced latency, with the promise of future advancements in messaging and mobility management.

To date all hardware associated with the infrastructure of the demonstration project are in place, configured and tested, functionally linking the Phoenix and

Yuma systems. With all technology elements in place, the Department recommends no further development of the project until such time as two major decisions points are readdressed and answered:

1. **The Statewide Concept for Design**
   This study and engineering analysis was completed by Federal Engineering but has not undergone further review, discussion and approval by the PSCC. The concept for design ultimately drives future decisions which will impact interoperability and "operability" capabilities of all public safety users in Arizona. The design and functionality of these systems will affect future funding decisions related to state agency basic radio needs and possible transition to 700/800 megahertz.

2. **Governance Model Document**
   The Governance Committee of the PSCC developed a high level, first draft of a state interoperability radio system governance model. This document has not been reviewed, modified or approved by the PSCC. A governance structure is needed to clearly identify ownership and long-term maintenance for shared systems operation. Governance will also define similar issues for additional equipment, sharing of infrastructure or installation and use of portable or mobile radio equipment installed in vehicles.

Without these critical elements in place, further development of the operational component of the demonstration project could potentially be misguided or a waste of funding. At this time, even a high level estimate of the staffing, labor, planning and equipment requirements is difficult to assess until a decision has been made with regard to the conceptual design and governance. These discussions should be facilitated by GITA staff with the appropriate technical experts and stakeholders when PSCC activities are restarted in September.

In addition further development of the demonstration project at this point through the efforts of DPS staff will lead to confusion with current and future partners from both the public safety and commercial communities. We recommend that now is the best time to suspend the Demonstration Project to allow GITA to establish itself, have staff study and become familiar with the interoperability issue and technology and begin to act as the clear project lead going forward.

Other considerations where state funding priorities are concerned surround the continued funding for the analog-to-digital transition of the DPS microwave network. This project is a high priority and will require an estimated additional $40 million to complete the western and northern loops. The microwave infrastructure supports daily, mission critical operable communications for DPS, Department of Corrections (DOC), Department of Transportation (ADOT), Game and Fish and State Land.

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1:40 – 3:00 PM Facilitated Discussion: The Future for Arizona

DRAFT Definitions for Discussion Purposes ONLY

Operability vs. Interoperability

Operability: The ability of a single agency to share information within its own agency via voice and data communications systems.

Interoperability: The ability of public safety responders from multiple agencies to share information via voice and data communications systems on demand, in real time, when needed, and as authorized.

(Reference: Arizona SCIP, Appendix B).

System of Systems

A collection of functional, advanced communications systems that pool existing resources and capabilities together to offer increased functionality and performance?

Linkage of existing systems to enable interoperability, and synergism of command and control through one 'system' that appears seamless to the public safety first responder?

- One single system for all operable and interoperable needs for all first responder agencies statewide?
- A State of Arizona operable network that others can connect to?
- A connection of multiple systems with no main or core system?
- Other ?

Overlay

A gap closure definition? - A State owned and operated system that provides coverage between regional systems. State Agencies would need to be subscribers to all regional systems in order to have statewide radio coverage?

A total statewide coverage definition? - A separate, state owned and operated system that provides statewide coverage for all state agencies, as well as other agencies that choose to subscribe to the system?

Impact of the Economy on Discussions of the Future???

3:10 – 4:00 PM Facilitated Discussion: Next Steps

Governance

- Governance Committee

- **Attachment** - NGA Center for Best Practices Grant Award – Interoperability Focus on Governance / Policy Academy

Arizona SCIP Implementation Workshop

Wednesday, January 28, 2009, 10:00 AM – 4:00 PM
Carnegie Center, Main Floor Conference Room
1101 W. Washington, Phoenix, AZ 85007

Facilitated by Federal Office of Emergency Communications (OEC)

Goal is to continue to discuss implementing the SCIP as well as to discuss aligning SCIP initiatives with National Emergency Communications Plan (NECP).

Other Next Steps

- Arizona to attend National Statewide Interoperability Coordinator's Meeting Sponsored by the National Governor's Council - December 3-4, 2008.

- Arizona has received multiple questions regarding our Technical Assistance Requests so we know that these requests are being reviewed.

- Other?